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CHF

COOPERATIVE HOUSING FOUNDATION
LOCAL ENVIRONMENTAL POLICY AND PROGRAM INITIATIVE
(LEPPI)

FINAL PERFORMANCE REPORT OF CHF/LEPPI

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ACRONYMS-ABBREVIATIONS

ANAM	Government of Panama – National Environmental Authority
ANDA	Government of El Salvador – National Association of Aqueducts and Drainage Systems
CAPAS	Central American Protected Areas System
CBO	Community-Based Organization
CCAD	Comisión Centroamericana de Ambiente y Desarrollo
CHF	Cooperative Housing Foundation
COSTAS	Coastal Zone Management
EIA	Environmental Impact Assessment
EPA	U.S. Environmental Protection Agency
INDES	Government of El Salvador – National Sports Institute
LEAP	Local Environmental Action Plan
LEPPI	Local Environmental Policy and Program Initiative
MARN	Government of El Salvador Ministry of Natural Resources
MRF	Material Recovery Facility
NGO	Non-Governmental Organization
PROARCA	Programa Ambiental Regional Para Centro America
UNDP	United Nations Development Program
USAID	U.S. Agency for International Development
USEPA	U.S. Environmental Protection Agency

I. BACKGROUND

Environmental protection is a critical element to sustainable development in Central America, and the conservation of natural resources is essential to meet the medium and long-term development goals of the region. As environmental degradation of the natural resource base in the region accelerates and countries struggle to meet the needs of their growing populations, future economic growth is being compromised. With nearly 50% of the population in Central America already living in urban areas, and an annual urban growth rate of 4%, environmental degradation caused by urban pollution will continue unless aggressive action is taken to increase enforcement of environmental regulations and improve the awareness and capacity of local organizations to reduce and stop mismanagement of the environment.

The participation and empowerment of local communities to affect positive change in their countries is crucial to the success of any development program. In this effort, local governments can be effective mechanisms in leading and directing efforts against environmental problems such as air and water pollution, solid waste collection and management, and water and sewage treatment. But while their involvement is key to addressing the problem, the coordination and cooperation of national government, governmental environmental agencies, grass roots organizations with community at large, such as private sector professional and service organizations, nongovernmental organizations (NGOs), and community-based organizations (CBOs), is essential. In Central America, most local governments and private sector groups lack the resources and skills to assess the importance of environmental problems at the community level, consider potential solutions, and seek resources to address them.

II. CHF's LOCAL ENVIRONMENTAL POLICY AND PROGRAM INITIATIVE PROJECT (LEPPI)

The Local Environmental Policy and Program Initiative (LEPPI) supported the intentions of the Central American countries of Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica and Panama, to pursue sustainable development in the region as stated by the Central American Alliance for Sustainable Development. In September 1995, the United States Agency for International Development (USAID) awarded a Cooperative Agreement to the Cooperative Housing Foundation (CHF) to implement LEPPI in the region and CHF established an office in Guatemala to manage the project.

The main objectives of LEPPI were:

1) Assist 15-20 Central American communities learn a participatory methodology to identify and prioritize their urban environmental pollution problems involving stakeholders from local government and the public and private sectors.

2) Help communities prepare a Local Environmental Action Plan that describes a strategy to deal with up to three of the most important environmental problems and select one to be addressed.

3) Help each community develop and implement the action plan for the selected environmental problem through the provision of technical assistance and/or small grants.

4) Help communities mobilize national, regional, and international financial resources to solve their environmental problems.

5) Ensure that regional organizations such as the Central American Commission for Environment and Development (CCAD) and the Federation of Municipalities of Central America (FEMICA) are informed of the participating communities and seek their support during the implementation of the activity.

6) Seek the support of national, municipal development agencies for communities participating in the project.

7) Document the process of selection and capacity building of each community in the use of the environmental comparative management-risk assessment methodology, the preparation and implementation of local environmental action plans. This information will be prepared and disseminated by CHF to other communities in the region in order to show them the usefulness of approaching environmental problems with a methodology and action strategy.

8) Help each community establish an environmental monitoring system that includes baseline data to track results of the Local Environmental Action Plan (LEAP) and future environmental protection and mitigation activities

III. THE LEPPI METHODOLOGY

Through highly participatory processes, the LEPPI methodology strengthens the capacity of local governments and community-based organizations to evaluate and manage the most severe environmental problems facing their communities. A local steering committee coordinates the process. The committee consists of individuals interested in resolving environmental problems and represents a broad spectrum of governmental institutions; community-based organizations, educational institutions, private business, technical professionals, the media, and groups of concerned citizens. Initially, CHF/LEPPI staff provides training and facilitation, but over time, the steering committee itself carries out planning activities and promotes practical solutions to environmental problems.

The LEPPI methodology has been designed to fit the particular needs and character of developing communities, and in several important respects, differs from traditional

environmental planning and management processes. The LEPPI approach encourages communities to choose effective strategies to address the highest priority problems. The approach recognizes that many municipalities face severely limited resources for dealing with local environmental problems.

Emphasizing careful priority setting rather than comprehensive planning, the LEPPI methodology relies on broad-based, open participation by interested community members rather than conventional planning processes conducted by technical experts. In implementing environmental solutions, the LEPPI methodology process avoids traditional regulatory approaches, seeking instead consensus for non-regulatory measures that provide economic advantages for all participants. The methodology emphasizes multi-sector cooperation and helps communities find means to leverage limited local resources. The LEPPI methodology shows promise as a mechanism for small and medium-sized urban communities to improve environments throughout Central America and the developing world.

CHF has developed and successfully applied the Local Environmental Policy and Program Initiative (LEPPI) methodology for local planning and action in twenty-two (22) communities throughout six countries in Central America since September 1995. The methodology has successfully provided a sound basis for improving environmental conditions in these diverse localities. The LEPPI methodology represents a promising approach to facilitate development in urban areas throughout the developing world.

Four phases comprise the LEPPI methodology:

- **Initiation:** CHF has developed criteria for selecting communities in which to apply LEPPI. Careful analyses of community interests, capabilities, and resources serve to ensure that the planning process proceeds smoothly, that actions will be implemented, and that the community will be able to continue to resolve problems through participatory methods once the LEPPI ends.

- **Assessment:** After the formation of the steering committee during project initiation, a series of participatory public workshops identify the major environmental problems facing the community. Using comparative risk analysis techniques, the community analyzes and ranks environmental problems to pursue the three most serious. The community then develops and evaluates possible initiatives for addressing these three high priority problems. The most cost-effective strategies are selected and then synthesized into a full Local Environmental Action Plan (LEAP), identifying short-and long-term actions, institutional responsibilities, funding sources, legal authorities, available appropriate technologies, and other elements needed for implementation.

- **Implementation:** The community, guided by the steering committee, selects and implements a pilot project to advance an essential portion of the LEAP. CHF/LEPPI helps the community identify sources of support and collaboration for the LEAP. CHF/LEPPI also makes available a modest implementation grant to stimulate the pilot project quickly. The steering committee shares LEPPI's efforts with the appropriate local government agencies, non-governmental organizations, businesses and other entities capable of advancing the action plan.

- **Institutionalization:** The steering committee, local government, and community at-large continue to implement the action plan, while establishing formal processes and building capacity to manage new and changing environmental issues. Typically, the local government incorporates the steering committee. CHF/LEPPI arranges training sessions and information sharing opportunities for the participating communities.

IV. PROJECT RESULTS AND OUTPUTS

During the six-year life of LEPPI, CHF worked with twenty-two (22) communities in six Central American countries (including Panama). CHF efforts generated both public and private sector involvement that produced physical results towards the resolution of local environmental issues. CHF provided technical assistance and grants for the identification and implementation of environmental projects including the establishment and capacity building of local Steering Committees, the implementation of feasibility and technical studies, pilot projects and national and regional workshops.

Using the LEPPI process, CHF successfully mobilized communities and local municipalities throughout Central America to address their most pressing pollution and environmental problems. Through these efforts, communities are successfully reaching the following objectives of the LEPPI process:

- Strengthening the capacity of municipal governments to manage local resources;
- Identifying and ranking environmental problems at the local community level;
- Exposing communities to low-cost alternative technologies for reducing their environmental problems;
- Developing cost-effective strategies that can be implemented at the local level to mitigate identified environmental problems;
- Developing action plans that specify institutional responsibilities and available resources for enabling municipalities and community-based organizations to identify national and international sources of funding;
- Incorporating women and minority groups that are not traditionally included in the development process;
- Increasing partnerships and self-help approaches into solving environmental problems; and
- Improving the quality of life in communities where the project is implemented.

By September 2001, CHF/LEPPI made a substantial contribution to solve environmental problems in the following Central American communities:

- **Guatemala**-Antigua, Ixcán, Puerto Barrios and Livingston
- **El Salvador**- La Unión and Usulután
- **Honduras**- Choluteca, Trujillo, Omoa and Tela
- **Nicaragua** - San Juan del sur, Villa Nueva and Somotillo
- **Costa Rica** - Puerto Viejo and – Manzanillo, Costa Rica
- **Panama** - Bocas del Toro, Chilibre, Escobal, Nuevo San Juan, Limón and Buena Vista

Antigua Guatemala

Problem Identified: Solid Waste

Activities: CHF supported the implementation of an Economic Feasibility Study for Solid Waste Treatment in the towns of Antigua, Jocotenango, Alotenango and Ciudad Vieja in the Sacatepequez Department of Guatemala. This study analyzed the location and design of a sanitary landfill at the El Astillero Farm, in Alotenango.

A Materials Recovery Facility (MRF) was built with the purpose of encouraging the collection of recyclable materials in the area. The land for the MRF was provided by the Municipality of Antigua. The project looks towards building a sanitary landfill and an organic fertilizer plant, on property owned by the Municipality of Antigua, Guatemala.

Puerto Barrios

Problem Identified: Wastewater

Activities: CHF supported an Economic Feasibility Study for Treating and Final disposition of solid waste in the city of Puerto Barrios, Izabal and later supported the First and Second Phases of a Sanitary Sewerage System Project with two Treatment Plants.

This projects included three main components:

- Septic Tank in homes
- Sanitary Sewage Collectors
- Waste Treatment System

The project was implemented in two sectors of Puerto Barrios; in the El Cangrejal neighborhood, on the banks of the Escondido River, and then in the expansion phase in additional 20,000 square yards totaling 120 habitants. The waste treatment system consists of re-circulation pumps, sand filters and septic tanks. This system takes into account the standard measure of 150 Liters/inhabitant/day, the density of population/housing in streets or avenues, the distance to the treatment plant and the topography of the area. The design is estimated to serve the community for a period of up to 20 years and cover a population of

more than 120 households. The design was developed with technical assistance provided by the US Agency for Environmental Protection (USEPA).

This project is working successfully and has received ongoing supervision from the Health Department in Puerto Barrios and by the Post-graduate School of Sanitary Engineering of the San Carlos University.

Problem Identified: Solid Waste:

Activities: A comprehensive Feasibility Study for the Treatment of Solid Wastes in the City of Puerto Barrios was carried out. Based on the results of this study, which included five components: Collection, Transportation, Selection, Treatment and Final Disposition, the community implemented the construction of a Materials Recovery Facility (MRF) on the Piteros Farm, owned by the municipality, to encourage the recycling of products such as glass, metal, cans, etc.

The final design of the sanitary landfill and an organic material treatment plant, which will have the capacity to support the populations of Santo Tomas de Castilla Port and the City of Puerto Barrios, was completed and turned over to the municipality in March 2001. Financing is still pending for this project.

Ixcan, Guatemala:

Problem Identified: Wastewater

Activities: In working with the community and local authorities in the Ixcan, CHF was successful in assisting the municipality in the development of an Environmental Action Plan. The Plan was developed with full community participation and led to CHF support for the construction of a sanitary sewerage system and a treatment plant in sector No. 44 of the Nuevo Amanecer neighborhood and the La Paz neighborhood in Playa Grande, Ixcan. This sewerage system benefits 1,020 people. This project, which was implemented in two phases, was a significant contribution to environmental development in one of the poorest areas of the city and an important service to the local initiatives to lower the environmental pollution problems. Support for the Ixcan Steering Committee also included the construction of a reception vault for wastewater from the market and from Nuevo Amanecer neighborhood.

Livingston, Guatemala:

Problem Identified: Wastewater

Activities: CHF hired a consultant to carry out an Economic Feasibility Study of a wastewater treatment plant in Livingston. A vital part of the study was carried out with support and input from the USEPA. The treatment system design consists of re-circulation pumps, sand filters and septic tanks. This system takes into account the standard measure of 150 Liters/inhabitant/day, the density of population/housing in streets or avenues, the distance to the treatment plant and the topography of the area. The design is estimated to

serve the community for a period of up to 20 years and the population served would be from 600 users (100 house connections) to 983 (164 connections).

La Unión, El Salvador

Problem Identified: Sewage and wastewater

Activities: CHF supported the design and planning of a sanitary sewerage system consisting of a pumping station that will send the sewage to a septic tank. From the tank the water circulates through a stone filter and then goes again into a pumping system to recycle water in an underground irrigation system. This system was designed for a flow of 10,000 gallons per day (0.42 liters per second). The design was received, completed and approved by USEPA.

The design complies with the Environmental Impact Evaluation approved by Ministry of Natural Resources (MARN) and was authorized by the ANDA (National Association of Aqueducts and Drainage Systems). The project was also publicized in local newspapers to generate public discussion. The INDES (National Institute for Sports in El Salvador), the landowner, authorized and agreed with the construction and usage of the soccer field for underground irrigation.

Problem Identified: Solid Waste

Activities: CHF contracted a study for the Integral Treatment of Solid Waste and Collection System. The study contemplated the potential locations of Transfer Centers in different parts of Puerto de La Unión. The objective of the project is to train people to recycle products and deposit them in different containers in the Transfer Centers. Disposable materials would be carried to the sanitary fill after the removal of recyclable materials, thereby guaranteeing it 20 years of useful life.

Usulután, El Salvador

Problem Identified: Solid waste

Activities: CHF implemented an Economic Feasibility Study and the design of the inter-municipal garbage collection system and sanitary landfill for the towns of Usulután, Puerto El Triunfo, Concepción Batres and Ereguayquin. Three different municipal administrations attempted to implement complete without any concrete action or completion. CHF/LEPPI assisted the Municipality by completing the study, as well as the following activities/achievements:

- The purchase of a 600,000 square yard plot of land to build the sanitary landfill in the jurisdiction of Usulután.
- The construction of a bridge and the road to the landfill.
- The excavation for the first cell of the sanitary fill, with USAD/El Salvador funding.
- The ongoing operation of the sanitary landfill and the inter-municipal system.

Tela, Honduras

Problem Identified: Sewage and wastewater

Activities: The study and design of the Sanitary Sewerage System in the East Sector of the City of Tela, Atlantida. The study area is located in Tela Viejo, including the neighborhoods of Hiland Creek, Nueva Suyapa, Sitramedis, Suyapa, San José, San Antonio, Way, La Estación and Morazán. The beneficiary population is 6,419 people, which corresponds to approximately 85% of the total population. The project recommends using the existing treatment plant, which, according to the designer engineer, still has capacity to treat the flow from the extension of the sanitary sewerage net. The extension of the collection net system would be 19 kilometers long, using PVC sewage pipes of 8 and 10" diameter with house connections of 6" diameter. The project is scheduled to be implemented with technical support from FUNDEMUN through the Municipal Development Programs of USAID/Honduras.

Omoa, Honduras

Problem Identified: Sewage and wastewater

Activities: A Sanitary Sewerage Study and Design was conducted for the Costa Rica neighborhood. The design contemplates:

a) Main collecting net for liquid sewage
b) Septic tanks designed for the primary treatment of final discharges from the system

A total of 108 households (756 people) will benefit from this project. This community does not have a sanitary sewerage system. People mostly use latrines and dispose of wastewater in street gutters with the consequent environmental contamination.

Choluteca, Honduras

Problem Identified: Solid waste and waste water

Activities: CHF supported a solid waste study in the city of Choluteca. This study deals with the evaluation of options for the collection system and final disposition of solid residues from the city. The sanitary landfill will have a useful life of 15 years given the size of the land, topography and location of the water table. It also deals with the operation in a mechanized way. The waste production is of 0.338kg per person a day for this year (2001), and the projection for year 2002, in relation to the 102,946 people, is of 46,305 kg daily.

CHF implemented a Wastewater Study and the final design of the sanitary sewerage system in the West Sector of Choluteca; El Estadio, Cabañas, Piedras Azules, An Luis, Camo Luna, El Cortijo, La Ceiba, Marcelo Gerín, El Progreso, Alegría, Las Acacias, El Aterrizaje, Campo Sol neighborhoods.

The study recommends several works that will allow the expansion of the present sanitary sewerage system collection net to provide a more efficient and functional service for the system users, extend its coverage, improve sanitary conditions and preserve the environment.

San Juan del Sur, Nicaragua

Problem Identified: Solid waste

Activities: CHF supported the construction of the Materials Recovery Center. With support from LEPPI staff in the negotiations, the community succeeded in purchasing the land for the Center. The project consists of a 16-feet-deep water well, with a lixiviated pile and trenches for the sanitary fill. A ford bridge for entrance to the property, which guarantees traveling of collection trucks in the winter season, was also built.

Villa Nueva y Somotillo

Problem Identified: Solid waste

Activities: CHF conducted a Technical and Economic Feasibility Study for integral treatment of solid wastes in the towns of Villa Nueva and Somotillo.

With support and advice from LEPPI staff, the municipality rented an 80,000 square meter piece of land for 7 years, with an extendable contract for up to 14 years, for 25,000 Cordovas (US$1,835).

Puerto Viejo – Manzanillo, Costa Rica:

Problem Identified: Solid waste

Activities: CHF/LEPPI and the SteeringCommittee looked for and negotiated the purchase of a piece of land for building the leading project of a Materials Recovery Facility (MRF). The MRF was built, and operates under the supervision of ADECOMAGUA, company in charge of the collection system of the towns of Puerto Viejo and Manzanillo. Plastic and carton products, clear and dark glass are recycled in this center The Center also offers training courses and environmental education.

Trujillo, Honduras

Problem Identified: Sewage and wastewater

Activity: CHF supported the design of sanitary sewerage system and treatment plant for the City of Trujillo. This project consists of the infrastructure formed by the pipe net, special structures and equipment for securing and evacuating wastewater, with a minimum net diameter of 8 inches.

Chilibre, Panama:

Problem Identified: Solid waste

Activities: CHF supported the development of a solid waste collection system for the town of Chilibre. The Feasibility Study and organization of local micro-enterprises that will take the waste to Patacón Hill and sell recyclable materials.

The project is located in Chagres National Park and the objective is the collection, separation and final disposition of waste; the small company of Environmental Matters of Chilbre was formed. This company is the leadoff for operations in 6 communities (Buenos Aires, Agua Bendita, Agua Buena, Maria Eugenia, San Vicente and Chilibrillo).

Contracts were made for neighborhood garbage collection. To this date, there are 900 contracts with different costs and fees: B./4.00 for residents and B/ 10 to B/20 for businesses.

A Financial Study and the best option for the collection system in Chilibre was preared. Two choices were adopted, a private system and a mixed system with direct participation of the Community Association.

It was not possible to build the Recyclable Materials Center because the Community Association of Chilibre did not have any land or property. The piece of land was eventually donated to the Community Association, but it lacks an access road at this time.

Bocas del Toro, Panamá:

Problem: Solid Waste

Activities: A study of the Solid Waste project for Bocas del Toro, Carenero and Bastimentos islands was carried out. The Project Design and the Environmental Impact Assessment (EIA) that was approved by ANAM (National Environmental Authority), was also conducted. The land selected showed some initial environmental problems and for this reason it was not possible to carry out the project. After several attempts, failures and negotiations with the support of the Steering Committee, a piece of land was finally selected and authorized in the area with no risk pollution to the water table.

CHF carried out a Technical study for the identification of alternatives for the integral treatment of solid waste in Bocas del Toro Islands, Carenero, Bastimentos, Provincia de Bocas del Toro. A study Case was written and the municipality has developed an Environmental Action Plan.

Canal Basin Communities

Buena Vista
Limón
Nueva Providencia
Nuevo San Juan
Escobal

Problem: Solid Waste

Activities: CHF organized Environmental Steering Committees in each of the five Canal Basin Communities and an Environmental Action Plan was made for each community. A technical and financial study was also conducted to identify the alternatives for environmentally sound treatment of solid waste coming from the towns of San Juan, Buena Vista, Nueva Providencia and Limón, in the district of Colon. A study was also conducted to identify the alternatives for integral treatment of solid waste in the Escobal community.

Case Studies

Results: The LEPPI methodology has been applied to a variety of settings. During project implementation CHF documented the process and lessons learned in three case studies highlighting appropriate implementation practices in urban/rural environmental pollution management.

Municipal Ordinance and Monitoring Systems

Results: CHF/LEPPI provided technical support to nine (9) communities in preparing and implementing municipal regulations and/or ordinances toward the solution of local environmental problems which tend to mitigate, lessen or avoid environmental contamination in key areas: urban, national parks, biological reserves etc.

CHF/LEPPI also provided further technical support to municipal officials and direct project beneficiaries in five (5) Central American communities to design and operate environmental monitoring systems for key pollutant: waste water, solid waste, etc.

National Regional Workshops Seminars

Results: During this project CHF/LEPPI organized two (2) National workshops/seminars (Puerto Barrios, Guatemala), one (1) National workshop/seminar (Honduras), and two (2) regional workshops (San Salvador, El Salvador and Tegucigalpa, Honduras) to share information on feasible technical and economic solutions regarding pollution management problems (e.g. solid waste and wastewater).

V. LEPPI PROJECT LESSONS LEARNED

CHF International successfully applied the demand-driven LEPPI methodology in 22 communities throughout Central America, proving its value as a model for participatory comparative risk assessment and management. As with any community-based program or initiative, there are challenges to be met and overcome. Some of these challenges were specific to the communities in which LEPPI was being carried out, while others were inherent in the process and/or conditions of the culture where the LEPPI methodology was applied. A discussion of the salient challenges provides insight for future programs, as well as for improving similar ongoing initiatives.

The following 'lessons learned" were drawn from the results of national and regional workshops involving steering committee members, municipal and government authorities. The three case studies published by CHF International documenting the LEPPI methodology in communities in Guatemala, El Salvador, and Panama were also a valuable source of information on Lessons Learned.

Implement action plans quickly and effectively

The effective and timely implementation of the LEAPs may be the most overriding challenge faced by LEPPI. In contrast to the planning process, which is well defined and closely guided by LEPPI staff, the process for implementation and the responsibilities of stakeholders can be somewhat ambiguous. Community leaders and the steering committee are expected to take the lead in instigating action, but numerous organizations and individuals are charged with actually carrying out the actions called for in the community's Action Plan. Therefore, effective implementation requires foresight on the part of the recipient to circumvent or cope with unexpected delays. This may require additional or ongoing training. Since communities often require support from outside sources (e.g. government agencies, consultants, potential donors), LEPPI must serve as a link between the community and outside supporters. It is essential for LEPPI to anticipate community needs and to help the steering committee to stay on track.

Successful implementation depends on successful planning and capacity building on the local level. By addressing the specific issues in each community early on and continually throughout the LEPPI process, the probability of continued progress in overcoming pressing environmental problems is greatly enhanced.

Ensure that planning is a community-based process

Grassroots environmental action planning is typically a novel process for municipal governments and community members in developing countries. As a result, the spirit in which planning is carried out and the level of commitment from participants determines the fate of the plan. The success of the process has implications on how multi-sector collaboration between government agencies, NGOs, community groups, and businesses will fare in the future. It is important that all major community interests participate in the workshops and that all involved regard the Action Plan and the LEPPI process as practical and able to bring about realistic and positive outcomes. The plan and the process must be

taken seriously and be regarded by the community as an opportunity to decide its own environmental future, as opposed to being considered merely as an exercise to obtain assistance from external development organizations and donors.

Staff must work extensively to ensure that the community takes the lead on environmental planning and must work closely with the steering committee to develop a readable, useful and accurate document. Providing enough direction without building dependency is an ongoing challenge throughout the LEPPI process.

Ensure that planning is a community-based process.

Grassroots environmental action is typically a novel process for municipal governments and community members in developing countries. Due to this, the spirit in which planning is carried out and the level of commitment from participants determines the fate of the plan. All major sectors of the community must participate in the workshops and regard the plan as an opportunity to decide their own environmental future, as opposed to being a pretext for obtaining assistance from donors.

Maintain an active steering committee

The steering committee serves as the backbone of LEPPI activities in the community. The planning phase of the LEPPI process requires consistent involvement and guidance from steering committee members. In the implementation phase, the steering committee must take the reins in negotiating with various actors and stakeholders to craft viable solutions to the community's most pressing environmental problems. Maintaining a high level of energy and willingness to work among a diverse group of volunteers, however, is often challenging.

Throughout the LEPPI process, staff must work closely with the steering committee to quickly address their concerns and needs along the way. This support system not only encourages continuous progress in the planning and implementation phases, but also allows the LEPPI staff to quickly address any potential obstacles or delays in the process. When requested, or when LEPPI staff foresees a need, special meetings or specialized training programs may be held for the steering committee and/or community members. Conferences and seminars focusing on specific aspects of environmental risk management can also be held. This provides incentives, and offers opportunities for participants to share similar experiences. Outside training events and meetings are strong motivators for those who do not often have the chance to leave their own communities and broaden their perspectives.

Ensure active and continuous municipal support

The support and endorsement of the municipal government is critical for the LEPPI process to succeed. When selecting communities to apply the LEPPI methodology, strong and ongoing support from the prevailing government authorities should be ensured.

Inevitably, however, new administrations and staffing changes sometimes bring changes in priorities and political will. It is important to maintain local government support by engaging key authorities throughout each phase of the LEPPI process and by offering guidance and training on environmental risk management.

LEPPI assists the steering committee institutionalize the LEPPI process into local government procedures. As one strategy for improving environmental conditions, it encourages the adoption of legislative and regulatory measures to control environmental pollution, ensuring ongoing governmental attention, and commitment to addressing environmental problems. In seeking an official role for the steering committee, LEPPI secures mechanisms for keeping the environmental concerns of the community on the agenda of the local government.

Secure Funding to Address Environmental Problems

LEPPI provided limited funding for communities (typically $10,000 to $30,000 per community) to stimulate projects that are prioritized actions in their LEAPs. The funding was applied towards contracting technical support, acquiring and installing pollution control technologies, leveraging additional money from other organizations, promoting policy reforms, and the development of local regulations and ordinances. It was also be used for education and outreach regarding environmental problem solving. In many cases, this limited funding was not sufficient to fully address the full range of environmental risks encountered in a community. Communities must be oriented, from the outset, to look beyond LEPPI to raise funds for the implementation of comprehensive solutions.

With its regional and international expertise, LEPPI staff consistently exposed communities to a variety of potential support mechanisms. Future efforts should facilitate relationships between the steering committee and representatives from national and international development organizations, government ministries, NGOs, and private businesses to assess possible working relationships and funding opportunities. Through training and conferences outside the community, the steering committee and other community members should be exposed to available financing options. Workshops on comprehensive project planning, writing and submitting proposals, and networking with potential donors are additional means by which the steering committee and community can be supported in soliciting funds for project implementation.

In addition to outside financial resources, LEPPI assisted communities in identifying and developing their own economic resources. Through the creation and maintenance of local businesses and micro-enterprises that work towards alleviating environmental problems, communities create win-win situations where environmental improvement and economic growth occur simultaneously.

Recognize the core importance of environmental education and awareness campaigns

In dealing with environmental issues, it must be realized that many fundamental conceptions are being challenged. Mentalities about humans and their role to nature must be changed, as well as the perception about the role of the government and the

responsibility of the citizen to assume certain tasks and costs. This does not occur at once, but rather gradually through sustained efforts. Therefore environmental education and campaigns are central to this effort.

Technical "Lessons Learned"

- The implementation of a solid waste treatment projects should be accompanied by and adequate environmental education program, in which people learn through instruction separation techniques and waste recycling, to increase the useful life of a sanitary fill.

- The construction of basic infrastructure projects should begin in the dry season. Climate conditions and different soil types can make it difficult to work in excavations during the rainy season. This problem can cause delays in construction, increase construction costs and require that some work may need to be repeated.

VI. RECOMMENDATIONS

A. Coordination: A better relationship should be developed among the PROARCA components and the communities in order to unify criteria, optimize economic and social resources and achieve better results.

B. Policies: Make sure that municipal authorities have established policies and laws for accomplishing the objectives of the programs, before including them within the PROARCA project.

C. Recognition: Plan strategies to secure that the Steering Committees are formally recognized by Municipal Councils as environmental advisors.

D. Monitoring: Develop or implement a project tracking data base for the implementation of projects in order to verify the effectiveness of all project aspects with expectations originated in the community during the process of implementation.

APPENDIX A – STEERING COMMITTEES:

NAME	INSTITUTION	TELEPHONE
Puerto Barrios,Guatemala		
1. Arnulfo López	Minist. Medio Ambiente	(502) 9485487-7158924
2. Mario Chigua	Alcalde,	(502) 948-8404
3. Edgar Belteton	Consejal Municipalidad	(502) 948-8404
Ixcan, Guatemala		
4. Mario	CHF/Ixcan	(502) 2050432
Antigua, Guatemala		
5. Abel Montenegro	Municipalidad	(502) 8320535 - 8320553
Livingston, Izabal,Guate.		
6. Byron Chacón	Alcalde	(502) 9470070
7. Douglas Warren	Municipalidad	(502)9470027
8. Omar Gamboa	Planificacion Tecnica	9470485
La Unión, El Salvador		
9. Mario Osorto Vides	Alcalde	(503) 604-4908/604-4031
10. Ivan Hernández	Municipalidad	(503) 604-1828
11. Rafael Romero	Municipalidad	(503) 604-9080
Usullután, El Salvador		
12. Ana Graciela Handal	Municipalidad	(503) 662-0072
13. Jose Angel Benitez	Municip/Relleno Sanitario	(503) 624 2146
14. Hipolito Baltazar	Alcalde	(503)5520062
Tela, Honduras		
15. Milton Castillo	Municipalidad	(504) 448-2729
Choluteca, Honduras		
Juan Benito Guevara	Municipalidad	(504) 882-0509
Roberto Maradiaga	DIMOSEP	(504) 8823815
Choluteca, Honduras		
Juan Benito Guevara	Municipalidad	(504) 882-0509
Roberto Maradiaga	DIMOSEP	(504) 8823815
Omoa, Honduras		
Domingo Menjivar	Municipalidad	(504) 6589149
Urlich Lang	Dueño restarurante	(504)6650453
Trujillo, Honduras		
Alex Amaya	Unidad ambiental Municip.	(504)4344-4648
Wilfredo Chavez	FUCAGUA /ong	(504) 434-4294
Marco Antonio Pavón	Alcalde	

San Juan del Sur		
Marvin Palacios	INIFOM	(505) 266-6336
Jorge Sanchez	Vice alcalde	(505) 458-2383
Jaqueline Membreño	MARENA	(505) 263-2095
Villanueva y Somotillo		
Hector Carrazco	Somotillo	Arq. Marvin Palacios de
Denis Aguilera	Villanueva	INIFOM Tel. (505) 2666336
Luis Saul Pineda	Somotillo	
Puerto Viejo Manzanillo		
Aurora Gamez	Almonds and Corals	(506) 272- 2024/7500232
Edwin Paterson	Restaurante Tamara	(506) 750-0148
Julio Muñoz	Manzanillo,Talamanca	(506) 750-0180
Bocas del Toro		
Luis Mou Sue	Smithsonian	(507) 757-9794
Isabel Alvendas	CARIBARO	(507) 757-9488
Eladio Robinson	Alcalde	(507) 757-9891
Chilibre, Panama		
Vidal Garcia Ureña	Junta Comunal	(507) 2162119
Miriam Mendoza	Junta comunal	(507) 216 2112
Mariela de Edward	Casa	(507) 266 5568
Cuenca del Canal, Panama		
Joel Pitti	Escobal,	
Rigoberto Rodriguez	Iglesia Cristo, Escobal	
Isabel Rodríguez	Comite Ambiental, Escobal	
Clinton Rodriguez	Nva. Providencia	(507) 4425386
Gisela Hall	Nva. Providencia	(507) 434-4639
Luis Coronado		443-4376
Benito Acuña	Buena Vista	(507) 448-0178
Beverly Campbell	Buena Vista	(507) 448-1840

APPENDIX B – LEVERAGING FUNDS:

CHF/LEPPI has leveraged more than $1.3 million from local communities and local governments for implementation of pilot projects. An additional $2.6 million has been leveraged from other donors, including national government institutions from all six countries where LEPPI communities are located, bilateral USAID Missions, the Governmental of Canada, and the United Nations Development Program (UNDP). These funds have assisted CHF/LEPPI in accomplishing USAID/G-CAP environmental Strategic Objetive: Effective Stewardship of the environment and natural resources and achieve the USAID goal of environmental management for long-term sustainability.

APPENDIX C: LIST OF TECHNICAL DOCUMENTS

GUATEMALA

1. Plan de Acción Ambiental Puerto Barrios, Izabal
2. Estudio de Factibilidad Economica para el manejo de Desechos solidos ECONSULT
3. Estudio de Caso de Puerto Barrios, Izabal
4. Proyecto Piloto, Tratamiento de Aguas Residuales, Puerto Barrios.
5. Diseño del Relleno Sanitario y Planta de Abono orgánico de Puerto Barrios (Econsult)

HONDURAS

1. Memoria Final, Estudio y diseño final del sistema de alcantarillado sanitario Sector Este de Choluteca.
2. Estudio y Diseño final del sistema de alcantarillado sanitario Sector Oeste de Choluteca.
3. Reglamento para el manejo y administración del sistema de alcantarillado sanitario, Choluteca, Honduras.

PANAMA

1. Estudio de factibilidad técnica y económica para la creación de una Micro Empresa de Gestión Ambiental Centro de acopio y una planta de compostaje en Chilibre, Panamá.
2. Estudio de Caso Bocas del Toro
3. Estudio de alternativas para el manejo de desechos solidos en las Islas Carenero, Bastimentos y bocas del Toro.
4. Diseño del Relleno Sanitario

NICARAGUA

1. Perfil del Proyecto, Manejo Integral de Desechos Sólidos de San Juan del Sur
2. Estudio de Factibilidad proyecto desechos solidos de San Juan del Sur

COSTA RICA

1. Planificación del Centro de Recuperación de Materiales, Puerto Viejo, Manzanillo Costa Rica

EL SALVADOR, LA UNION

1. Consultoría para el diseño del Sistema de Recolección y de disposición final de los Desechos Sólidos.
2. Estudio de Impacto Ambiental
3. Diseño del sistema de recolección para la Unión
4. Diseño de Plantas de Tratamiento y sistema de irrigación subterranea en campo de foot ball

EL SALVADOR, USULUTAN

1. Estudio de Factibilidad y Diseño del sistema de recolección de desechos sólidos entre los municipios de Usulután, Puerto El Triunfo, Concepción Batres, y Ereguayquin, Informe Final.

PERFILES AMBIENTALES Y PLANES DE ACCION AMBIENTAL:

Perfiles Ambiental y Planes de Acción Ambiental, elaborados por las comunidades y CHF :

1. Puerto Barrios,Guatemala
2. Ixcan, Guatemala
3. Usulután, El Salvador
4. La Unión, El Salvador
5. Choluteca, Honduras
6. Trujillo, Honduras
7. San Juan del Sur, Nicaragua
8. Puerto Viejo y Manzanillo, Costa Rica
9. Bocas Del Toro, Panamá
10. Chilibre, Panamá
11. Buena Vista, Cuenca del Canal de Panamá
12. Escobal, Cuenca del Canal de Panamá
13. Limón, Cuenca del Canal de Panamá
14. Nueva Providencia, Cuenca del Canal de Panamá
15. Nuevo San Juan, Cuanca del Canal de Panamá

ESTUDIOS DE CASO ELABORADOS POR LEPPI:

1. Estudio de Caso, Proyecto CHF/LEPPI, Puerto Barrios, Izabal
2. Estudio de Caso, Proyecto CHF/LEPPI, Usulután, Ereguayquin, Concepción Batres, Puerto El Triunfo, El Salvador
3. Estudio de Caso, Chilibre, CHF/LEPPI
4. Estudio de Caso Bocas del Toro, CHF/LEPPI